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ABSTRACT

Researchers analyze the cost effectiveness of educational administrator training programs for Native Americans at four universities: Harvard, Pennsylvania State, Minnesota, and New Mexico. The programs vary in scope, duration, clientele, admissions, and five other characteristics. The programs' average costs per student are computed and are related to differences in program characteristics. The researchers then compile effectiveness rankings for seven different outcome measures, including program completion rate, post-program jobs and salaries, shifts in job aspirations, and students' perceptions of program quality, changes in their decision-making responsibilities, and realization of preprogram expectations. Program rankings on each outcome are weighted and averaged, and a measure of program cost per unit of effectiveness is computed. While one unidentified school is found to have lower costs, the authors conclude that no school can be considered more cost effective because the use of different outcomes or weights would yield different figures for cost effectiveness. They discuss the problems of analyzing the cost effectiveness of social action programs, especially in relation to variation in program goals, structures, resource constraints, and outcome measures.
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A Cost-Effectiveness Analysis of Administrator Training Programs for Native Americans

Monograph

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A COST-EFFECTIVENESS ANALYSIS OF ADMINISTRATOR TRAINING PROGRAMS FOR NATIVE AMERICANS

As an evaluation methodology, cost-effectiveness analysis is designed to assist in the determination of which among several feasible courses of action will utilize resources most effectively. This methodology has been accepted by educational decision-makers as an aid in selecting policy alternatives on the basis of least cost and greatest effectiveness.[1] The study described in this article applies the methodology of cost-effectiveness analysis to four graduate programs[2] designed to prepare Native Americans to assume leadership roles in education.

As stated by Levin, cost-effectiveness takes as its focus the determination of "that strategy or combination of strategies that maximizes the desired result for any particular resource or budget constraint."[3] Embedded within this statement are four variables

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[1]Terry G. Geske, "Some Observations on Cost-Effectiveness Analysis in Education," Journal of Education Finance 4 (Spring 1979), pp. 451-468.

[2]Programs compared in this analysis were located at Harvard University, The University of Minnesota, The Pennsylvania State University and The University of New Mexico. The major data sources are the "Evaluation Report of Indian Education Administrator Training Program at Universities of Harvard, Penn State and Minnesota" (Albuquerque: Indian Education Resources Center, Bureau of Indian Affairs, 1975), and comparable sources from the University of New Mexico program. Programs are presented herein as A, B, C and D to focus attention on programmatic differences and the methodology of cost-effectiveness rather than on institutions.

[3]Henry M. Levin, "Cost-Effectiveness Analysis in Evaluation Research," Handbook of Evaluation Research, eds. M. Guttentag and E.L. Struening (Beverly Hills, Ca.: Sage Publications, 1975), p. 89.

germane to cost-effectiveness analysis: goals ("the desired result"), alternatives ("strategies"), constraints ("resource or budget") and outcomes or effectiveness ("maximizes the desired result"). Each of these variables are addressed in the context of the four institutional programs analyzed.

GOALS OF ADMINISTRATIVE TRAINING PROGRAMS

Each of the training programs adopted as a primary goal the preparation of personnel with necessary skills to assume leadership positions in the field of education. Programs emerged from a

> ... pressing need to prepare selected Indian persons with high potential leadership abilities and provide them specialized training in management, administrative and change agent skills which would be utilized in educational systems that directly affect Indian people.[4]

While this goal statement is indicative of institutional responses to the national social consciousness prominent in the 1970's, institutions found modifications appropriate. Goals specific to the alternative programs are as follows.

> Program A: to produce graduates in educational administration qualified to accept management and/or leadership positions in schools serving large numbers of Indian children.
>
> Program B: to provide opportunities in obtaining change agent skills.

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[4]"Evaluation Report of Indian Education Administrator Training Program at Universities of Harvard, Penn State and Minnesota" (Albuquerque: Indian Education Resources Center, Bureau of Indian Affairs, 1975), p.ii.

Program C: to prepare American Indians for administrative positions in higher education.

Program D: to train twenty [Native Americans] at the Masters level as administrators in the various types of schools serving [Native American] students.

Focusing the discussion on "program goals" clearly limits this analysis. An exhaustive goal-based evaluation would have to include the multiple goals of Indian tribes, funding sources, university graduate schools, colleges and departments, varied educational agencies, and students themselves. Constraints defined by each of these agencies and groups do, however, account for variations in goal statements and for variations in programs, or in the language of cost-effectiveness, the generation of alternatives.

ALTERNATIVE STRUCTURES FOR ADMINISTRATIVE TRAINING PROGRAMS

The interplay of a common goal and unique constraints generated four institutional alternatives for the training of Native American school administrators. Data presented in Table 1 illustrate differences and similarities along common dimensions.

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Insert Table 1 About Here
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Variable one, program model, identifies all four as being "nested", i.e., as programs within existing programs.[5] However, the degree of

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[5]Bill Burgess, William H. Holloway and Jerry E. Hutchinson, "Educational Leadership Development: The Contribution of One University," paper presented at Annual Meeting of American Education Research Association, Toronto, Canada (1978).

TABLE 1

INSTITUTIONAL ALTERNATIVES FOR TRAINING
NATIVE AMERICAN ADMINISTRATORS

Source of Variation	Program			
	A	B	C	D
1. Program Model	Nested	Nested	Nested	Nested
2. Scope	M.A. Ed. S. Ph.D.	M.Ed. Ph.D. Ed.D.	M. Ed. CAS Ed.D.	M.A.
3. Residency	Full-time	Full-time	Full-time	Part-time
4. Duration (M.A./M.Ed. Program)	One academic year	One academic year	One academic year	Two calendar years
5. Instructional Delivery System	Traditional	Traditional	Traditional	Innovative (1-5-1-5-1)
6. Client	Multi-tribal	Multi-tribal	Multi-tribal	Single tribe
7. Locus of Admission Decisions	"Special committee"	Program director	Institution	Shared: tribe and institution
8. Source of Funding	Federal government	Federal government	Federal government	Private foundation
9. Fiscal Control	Institution	Institution	Institution	Tribe

"nestedness" varied considerable. For example, program C contained "no training or courses designed specifically for the Indian students" and students, with advisor assistance, planned their own programs of study. In brief, students were "mainstreamed", i.e., absorbed individually into the existing training program. Further, program C functioned without a director and "primarily as a social organization for Indian students". In contrast, program D modified existing courses and devised new learning experiences, adopted a group rather than individual approach to programming and instructional delivery, had a director, and participants gradually acquired a unique identity within the university community. Programs A and B fell between these two extremes.

While all programs were "nested", they varied with respect to scope, residency requirements, duration, and instructional delivery system. Programs A and C were designed to offer the Masters, Certificate of Advanced Study (or the Education Specialist), and the Doctorate. Program B offered the Masters and Doctorate, while program D was limited to the M.A. Given variation in scope, variation in residency requirements followed. At the M.A. level, programs A,B and C required a full-time academic year residency with the expectation that the degree requirements could be fulfilled within that time frame. In contrast, the non-residency, part-time nature of program D required two calendar years (6 semesters) for completion. The latter difference, stemming from an early decision to minimize dislocation problems and enhance the probability of graduates assuming on-reservation work responsibilities, required the construction of a unique instructional delivery system. What envolved was, in program jargon, the "1-5-1-5-1" academic year

system, where one-week sessions of full-time study at the university were followed by five intervening weeks of full-time employment in professional work settings. In addition, students were required to attend two eight-week summer sessions on campus. Further refinements in the instructional delivery system included regularly scheduled "on-site Saturday sessions" and "instructional contracts", i.e., assignments designed to provide the opportunity to apply administrative concepts studied during residency weeks in the immediacy of the work setting. Clearly, this system varied substantially from the more traditional systems at the other three institutions.

Variation also existed relative to clients. While all students were Native Americans as determined by tribal census or blood quantum, programs A, B and C recruited nationally and inter-tribally while program D was limited to a single tribe. Clearly, this had implications for recruitment practices. A greater percentage of participants in program A (74%) and program B (81%) were male than in program C (62%) and D (56%). Students in program C were younger than those enrolled in other programs -- 40 percent of participants were 20-30 years of age while only 10 percent were over 40 years. In constrast, 13 percent of participants in program D were under 30 and 31 percent were over 40 years of age. Similarly, students in program C had fewer years of professional experience (38% had 1-3 years and 2% had over 16 years of experience) as compared with students in program D (2% had 1-3 years and 23% had more than 16 years of educational experience). The non-residential nature of program D tended to attract older, more experienced career educators than did the others.

Considerable variation was also present relative to admission processes. At program C there was no variation from general university procedures. Program A handled admissions on a "block basis" and upon the recommendation of a "special committee" comprised of five faculty members and the state Director of Indian Education. At program B, participant selection largely devolved upon the Program Director with input from faculty and students. More complex procedures used at program D involved review and screening by the tribal office of education, the BIA Area Office where appropriate, a program advisory Council, the faculty of the Department of Educational Administration, and the university Graduate School. In brief, admissions processes varied in complexity among the four training institutions.

The final sources of variation identified in Table 1 are related to fiscal matters. The funding source for programs A, B and C was the Federal government -- OE and the BIA; for program D it was a private foundation -- Carnegie Corporation of New York. More important, in the case of programs A, B and C, grants were made directly to the institutions; in the case of program D, funds flowed directly to the tribe with the university subcontracting for instructional services. Clearly, the latter condition altered the nature of the decision-making process, invoking shared decision-making to a degree not required by the other three institutions.

In concluding this discussion of variations the authors wish to "foreshadow" several issues to be addressed later. First, the extent of variation among programs was, in all probability, greater than that

indicated. Data limitations precluded speaking to such issues as scope and magnitude of academic demands, support services, faculty composition, facilities, and the like. Given that, it is uncertain whether or not the most sensitive sources of variation have been identified. Secondly, it may be argued that similarities among programs A, B and C are so pronounced as to constitute one rather than three alternatives. Hence the foreshadowed question of what within the framework of cost-effectiveness indeed constitutes "an alternative."

COSTS OF TRAINING PROGRAMS

As more educational programs have competed for fewer available resources during the past decade, the importance of examining both potential outcomes and potential costs of alternative strategies has led educational program evaluators to employ such methodologies as cost-benefit, cost-effectiveness, or cost-utility analysis.[6]

Each of these methodologies identify cost as a measure of inputs to the program being evaluated. The importance of understanding the evaluator's conception of cost is pointed out by Haller who suggests that costs represent "benefits foregone".

> A cost is a sacrifice of one benefit in order to attain another. Costs occur when a choice is made among several desired benefits. In short, costs are benefits -- benefits given up by choosing to do one thing rather than another.[7]

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[6]An extensive discussion of the distinctions between these methodologies is presented by Henry M. Levin, "Case Book on Cost Analysis in Educational Evaluation," Research on Evaluation Program Report No. 33 (Portland, Oregon: Northwest Regional Educational Laboratory, 1979).

[7]Emil J. Haller, "Cost Analysis for Educational Program Evaluation," Evaluation in Education, ed. W.J. Popham (Berkeley, Ca.: McCutchen Publishing Co., 1974), p. 407.

Resources which are diverted to implement a chosen alternative are no longer available for other competing programs. Opportunities are thus foregone when one program alternative is chosen rather than another.

Similarly, Levin defines costs as "that set of social sacrifices associated with any particular choice among social-policy alternatives".[8] Rather than focusing exclusively on the actual dollar costs of program alternatives, both Haller and Levin encourage evaluators to assess the losses to society, institutions, and individuals in the form of benefits and opportunities foregone.

In the present analysis of training programs for Native Americans, it is clear that social sacrifices are inherent in decisions by the government and other funding agencies to finance such programs. In addition, institutional decisions to direct time, energy, and facilities to these programs have meant sacrifices of potential benefits which could have been derived from other training or research endeavors. Moreover, individual students and families have foregone potential income, while society has foregone tax revenue and work productivity from the students enrolled.

It is difficult at best to assess the value of all the benefits sacrificed and opportunities foregone by a decision to implement a given alternative. Operationally, therefore, we have adopted Haller's stance that when an evaluator employs a dollar amount it is assumed that

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[8]Levin, "Cost-Effectiveness Analysis in Evaluation Research," p. 98.

"that figure will serve as an adequate measure and description of the resources required, the programs foregone, and the value of the foregone programs".[9] Further, data limitations restrict our discussion only to actual dollar costs of project administration, instruction, and student support. Clearly, there were other "costs." For example, differences in residency requirements raise the possibility that "earnings foregone" may be one of the associated costs. Students at programs A, B and C were required to leave their employment for a minimum of one year of full-time study on campus, while students in program D were able to remain employed. It appears at first that an analysis of earnings would reveal greater losses of salary to individuals and of taxes and productivity to society from the former programs than from the latter. Student and dependent stipends helped ease the individual sacrifices of full-time students in programs A, B and C; replacements for those students who left positions diminished the impact of their loss on their institutions. On the other hand, although students in program D did not forego earnings while on campus for one-week sessions, other costs were borne by the institutions they worked for: loss of their productivity, cost of replacements, effects of disruption on pupils by the loss of a teacher or principal every five weeks for two years, etc. The task of identifying such costs to individuals and institutions is beyond the scope of this study.

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[9] Haller, "Cost Analysis for Educational Program Evaluation," p.411.

Actual per student dollar costs of the four training programs are presented as Table 2. When deflated to comparable dollar values, the average per student cost of a program of studies ranged from $8,188 for program B to $9,919 for program C. Marginal costs for

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Insert Table 2 About Here

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programs indicate that program C is 21.1 percent more costly than program B.

Although average costs do not vary greatly among programs A, B and D, the proportion spent on project administration, instruction, stipends for students and dependents, and university overhead does fluctuate (see Table 3). The proportion spent on project administration and instruction was highest (53%) for program A and lowest for program B (35%). The lower percentage spent on administration (14%) for program C was offset by the higher proportion (29%) spent on tuition; just the reverse occurred in program B where a higher proportion was spent on administration (27%) than on tuition (8%). The higher average cost of program C (see Table 2) appears to be due both to the higher cost of tuition and high proportion of funds provided for student support, as indicated in Table 3.

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Insert Table 3 About Here

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Students in program D did not pay tuition separately since all costs of instruction were accounted for through the project. Although the proportion of the total budget expended on project administration

TABLE 2

PROGRAM COST PER STUDENT

Program	Year	Total Cost		Average Program Cost (1972)[b]	Marginal Cost	
		Actual	1972[a]		Amount	%
A	1972-73	$8,768	$8,768			
	1973-74	8,102	7,627	$8,584	$396	4.8
	1974-75	11,030	9,357			
B	1972-73	6,076	6,076			
	1973-74	9,699	9,131	8,188	--	--
	1974-75	11,030	9,357			
C	1972-73	9,664	9,664			
	1973-74	12,272	11,553	9,919	1,731	21.1
	1974-75	10,066	8,539			
D	1975-76	5,709	4,276			
	1976-77	6,190	4,354	8,221	33	0.4
	1977-78	5,643	3,703			

[a]In order to compare program costs, all were deflated to 1972 values using the Consumer Price Index, Bureau of Labor Statistics.

[b]Average cost of minimum time required for program completion: one year for programs A, B, and C, and two years for program D.

TABLE 3

COSTS FOR ADMINISTRATION, INSTRUCTION, STUDENT SUPPORT, AND INDIRECT COSTS AS A PERCENT OF TOTAL COSTS

	Program			
	A	B	C	D
Project Administration and Instruction	53%	35%	43%	65%
Project Administration	30	27	14	
Tuition	23	8	29	[46][a]
Tribal Administration	0	0	0	19
Total Student Support	22%	54%	41%	31%
Student Stipend	17	34	33	31
Dependent Stipend	5	20	8	0
Indirect Costs	7%	7%	7%	4%
Miscellaneous[b]	18%	4%	9%	0%

[a]Breakdowns are not available since the project paid for all instructional costs with tuition waived for students.

[b]Represents costs not accounted for.

and instruction for program D was much higher (65%) than at the other institutions, these costs include those incurred by the tribal education division, thus representing the increased cost of "dual" control (i.e., 19% of total expenditures). Student and dependent support consumed a greater proportion of the budget for program B (54%) and program C (41%) than for program D (31%) and program A (22%).

In sum, it appears that programs B and C placed a higher emphasis on student support, while programs A and D expended a higher proportion of their budget on project administration and instruction. More generally, in the language of cost-effectiveness, the total cost of program C represents the greatest sacrifice to society, i.e., it is 21.1% more costly to society to fund administrator training of the kind offered by program C than that offered by program B.

EFFECTIVENESS OF TRAINING PROGRAMS

As stated previously, cost-effectiveness analysis attempts to identify that alternative which maximizes the desired outcome. Typically, however, educational programs are characterized by multiple outcomes, hence increased complexity of assessment. Geske approaches that problem thus:

> Generally, a single criterion of effectiveness cannot adequately detect and estimate the possible effects of a program. In fact, even the measurement of progress toward attainment of a single objective often will require the use of multiple indicators. The assessment of program effectiveness is therefore typically based on a set of indicators or measurements.[10]

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[10]Geske, "Some Observations on Cost-Effectiveness Analysis in Education," p.459.

In Tables 4 through 9 which follow we present "a set of indicators" which bear on the effectiveness of the four Native American administrator training programs reviewed. As will become clear, the measures move on a continuum from hard/objective to soft/impressionistic. The reader is cautioned regarding these measures of effectiveness due to inconsistencies in the collection of program data and assumptions made by the authors in assessing program effectiveness. Indeed, as pointed out by Levin, differences in results of analysis may be due to "vagaries of evaluation procedures rather then differences in the actual program results."[11]

Perhaps the simplest effectiveness measure of academic programs is graduation data. Indeed, for institutions of higher education, completion of program/degree requirements may be the most salient measure of success. Table 4 presents data bearing on this measure.

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Insert Table 4 About Here

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Several observations can be made about the program completion data displayed in Table 4. First, the variability in numbers of participants cautions against direct comparability of completion rates. Secondly, only in the case of program D was a criterion established at the outset of the program -- 20 M.A. graduates per

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[11] Levin, "Case Book on Cost Analysis in Educational Evaluation," p.59.

TABLE 4

PROGRAM/DEGREE COMPLETION

	Program			
	A	B	C	D
Number of Participants	48	64	47	61
Program Completed				
Masters Degree	17	39	32	36
Certificate of Advanced Study (CAS)	—	—	—	—
Doctorate (EdD)	3	2	1	—
Completion Rate	41.7%	64.1%	70.2%	59.0%
Effectiveness Rank				
Criterion I	1	3	4	2
Criterion II	2	2	2	4

funding cycle. Hence measured against criterion, the graduation rate might be reported more accurately as 36 of 40 or 90% for program D. Finally, program/degree completion rates for all institutions can be expected to rise given the number of current enrollees.

Consistent with the rationale of cost-effectiveness evaluation, Table 4 also presents a rank ordering of the effectiveness of the four programs based upon the completion data displayed (4 = highest level of effectiveness). However, a criterion problem exists. If the percent of students admitted who completed the program is used (criterion I), then program C was the most effective, followed by programs B, D and A. Conversely, if one uses program criterion as the index (criterion II), program D was the most effective (completion rate = 90%). Further, in the absence of any known program criterion, as was the case for programs A, B and C, rank ordering convention in the present case requires assigning "2" to each of those programs.

While program/degree completion may be most meaningful to training institutions, utilization of skills in actual job placement is likely to be perceived as a more sensitive measure of effectiveness by Native American constituencies. Data on post-graduation employment are presented in Table 5.

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Insert Table 5 About Here

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Again, several observations can be made. First, graduates of all programs are to be found in a wide range of agencies and offices.

TABLE 5

POST-PROGRAM JOB PLACEMENT

	Program A (N=23)	B (N=42)	C (N=40)	D (N=39)
1. Federal Agency/Office[a]	1	1	3	0
2. State Agency/Office	0	1	1	0
3. Local Education Agency[b]				
Central Office	4	14	4	9
School Site	3	5	0	16
Classroom	0	3	0	2
4. Higher Education	3	4	4	2
5. Tribal/Inter-tribal	2	1	3	1
6. Research Agency/Office	0	0	2	2
7. Private Consultancy	2	0	2	1
8. Program Adm. (Miscellaneous)	2	5	2	0
9. Student	0	2	2	0
10. No Response	6	6	17	6
Placement Rate				
% of Respondents	73.9%	81.0%	52.5%	84.6%
% of Participants	35.0	53.0	44.7	54.1
Effectiveness Rank				
Criterion I	1	3.5	2	3.5
Criterion II	2.5	2.5	1	4

[a]Excludes BIA field level offices.

[b]Includes boarding schools, contract schools, etc.

Second, consistent with espoused and implicit program goals, graduates of program B and C tended to gravitate toward high-level policy making roles, while graduates of programs A and D tended toward field-based roles. This is most noticeable in the case of program D where the "target role" was the school principalship.

The relative effectiveness of the four programs as measured by job placement is indicated in Table 5. Ranks are based upon the percent of participants who indicated they had been placed in administrative positions (criterion I), and upon placements in positions directly related to program goals (criterion II). Overall placement rates of participants were higher for programs A and C than for programs B and D. On the other hand, if placement rates are more narrowly construed as goal-congruent, program D (central office and school site administration) outranks program C (higher education). As indicated, placement rates for programs A and B according to program goals fall between.

A related job placement indicator of program outcomes can be obtained by comparing the pre-program positions held by participants with their post-program preferences. Insofar as "preferences" may or may not be realized in the market place, it may be more accurate to describe any shifts which might occur as changes in aspiration level. However, raising aspirations has long been touted as an attribute of American education, particularly higher education, and therefore might properly be used in the present context. Data bearing on this phenomenon are presented in Table 6 and indicate

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TABLE 6

POSITIONS HELD PRIOR TO PROGRAM ENTRY
AND POST-PROGRAM PREFERENCES

	Program							
	A		B		C		D	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Local Education Agency								
School Administrator	4%	(43) %	0%	(29) %	13%	37%	5%	(85) %
Education Specialist	4	0	10	13	10	25	5	18
Teacher	17	--[a]	46	--	30	--	40	3
Higher Education								
College Instructor	--	27	--	14	--	(37)	--	5
Student	9	--	5	--	15	--	0	--
Tribe/Inter-Tribal	--	(17)	--	(24)	--	65	--	--
Unclassified								
Program/Project Adm.	40	--	13	--	44	--	30	--
Educ. Researcher	--	13	--	10	--	25	--	13
Other/Not Sure	39	0	25	11	31	30	20	10
Effectiveness Rank	3		2		1		4	

Note: Columns may not total 100% since students were permitted to select more than one response; circled percentages indicate shift consistent with program goals.

[a]A dash (-) indicates that the option was not included in questionnaires.

quite clearly that major changes in participants' aspiration levels occurred across institutions. The direction of change was decidedly upward, from teaching to administrative roles and from local education agencies and offices to more cosmopolitan settings, e.g., tribal offices and institutions of higher education. More broadly, the general programmatic thrust toward leadership roles appears to have been attained.

Effectiveness rankings based on shifts in aspiration as related to explicit program goals are also presented in Table 6. Program D which was designed to produce local school administrators is ranked highest (4) based on the 80% shift in preference to school administrative roles. Program A which sought to place graduates in high level field administration positions is ranked second (3) on the basis of the combined percentage (60%) of those roles circled; program B is assigned a rank of 2; and program C which had a higher education thrust is ranked last (1).

As a second measure of aspiration, data on anticipated future earnings were obtained by comparing pre-program earnings of participants with salary levels expected upon completion. Data displayed in Table 7 indicate that the median salary earned by students prior to

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Insert Table 7 About Here

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their admission in programs A, B and C was in the $11,000 to $13,000 range, while students entering program D earned slightly higher (median in the $14,000-$16,000 range). The higher incomes earned by

TABLE 7

SALARY LEVELS EARNED PRIOR TO AND
EXPECTED AFTER PROGRAM COMPLETION

	Program A		B		C		D	
Salary Range	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Over $20,000	9%	39%	5%	33%	5%	28%	10%	56%
$17,000 - 19,000[a]	0	13	0	17	5	25	23	31
$14,000 - 16,000	9	35	17	31	25	25	36	10
$11,000 - 13,000	48	4	43	12	35	18	26	0
Less than $10,000	26	0	33	0	25	0	5	0
Unemployed	4	0	2	2	5	2	0	0
No response	4	9	0	5	0	2	0	3
Effectiveness Rank								
Criterion I	2.5		2.5		2.5		2.5	
Criterion II	3.5		3.5		1.5		1.5	

Note: Arrows indicate shift in median (→), and shift in interquartile salary level (⇢).

[a]Salary ranges are not inclusive; it is assumed that ranges were interpreted as $17,000 - $19,999 etc.

students in program D are due partly to an inflationary factor during the four year period between surveys and partly to the higher ages and levels of prior experience of participants discussed earlier. Regardless of median pre-program earnings, median post-program salary aspirations rose two salary levels across all four institutions as indicated in Table 7. Hence in the effectiveness rankings based on the median (criterion I), each program was assigned the mean value of a four point scale (2.5). However, if the interquartile range rather than the median is used (criterion II), then some differentiation in effectiveness is noticeable.

Program outcomes can also be ascertained from a body of perception data. While such data are admittedly "soft", cost-effectiveness analysis permits their use. Two bodies of perception data were generated: (1) those relative to professional role enactment; and (2) those relative to the quality of academic program experienced. With respect to the first, students in all four programs were asked to compare the level of responsibility and decision making authority they now enjoyed with that prior to program entry. Data on perceived changes are provided in Table 8.

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Insert Table 8 About Here

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Consistent with data presented in Tables 6 and 7, program participants across institutions perceived themselves as having increased responsibility and decision making authority commensurate with leadership position and

TABLE 8

PERCEPTIONS OF PRE- AND POST-PROGRAM RESPONSIBILITY AND DECISION MAKING AUTHORITY

	Program			
	A	B	C	D
Responsibility and Authority:				
About the same	4%	7%	5%	21%
Increased	65	71	58	72
Decreased	9	2	2	5
No response	22	19	35	3
Effectiveness Rank				
Criterion I	2	3.5	1	3.5
Criterion II	2.5	4	2.5	1

salary level. Effectiveness rankings based solely upon this factor are presented as criterion I. (The trivial percentage difference between programs B and D resulted in a 3.5 rank for each.) Utilization of criterion II (percent of "increased" less percent of "decreased" plus "about the same") results in a different rank ordering. Criterion II, however, is suspect given the large variation in the "no response" rate.

The final sets of effectiveness data to be reported address participants' perceptions of program quality. In brief, respondents were asked to make judgements about their academic experience both in terms of quality and the degree to which their pre-program expectations were met. These data are displayed in Table 9.

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Insert Table 9 About Here

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As is indicated in Table 9, 90-95% of all students at all four institutions rated their programs as good or excellent, with a slightly higher proportion of students from programs B and D ascribing "excellent" ratings than those of programs A and C. This is reflected in the effectiveness rankings. (Effectiveness computed as the percentage of respondents indicating "excellent" less those reporting "inadequate" or "fair".) Similarly, the majority of students in program C (65%), program B (64%) and program D (80%) responded that their expectations were "definitely" or "very definitely" fulfilled; slightly fewer (47%) of the respondents in program A chose those options. These

TABLE 9

PERCEPTIONS OF QUALITY OF PROGRAMS AND
REALIZATION OF EXPECTATIONS

	Program			
	A	B	C	D
Quality of Programs:				
Inadequate	4%	0%	3%	0%
Fair	6	5	5	5
Good	43	40	55	33
Excellent	47	55	38	62
Effectiveness Rank	2	3	1	4
Expectations Realized:				
Not at all	0%	5%	0%	3%
Minimally	9	10	5	0
Generally	30	7	25	18
Definitely	30	40	35	49
Very definitely	17	24	30	31
No response	13	14	5	0
Effectiveness Rank	1	2	3	4

differences are reflected in the rankings assigned. (Rank of effectiveness based upon percentage of respondents indicating "definitely" and "very definitely" less those reporting "not at all" and "minimally.")

COSTS AND EFFECTIVENESS OF ALTERNATIVES

Comparisons of alternatives under a cost-effectiveness framework assist a decision maker by pointing out programs which derive a given level of effectiveness for the least cost or which yield the greatest level of effectiveness at a given cost level. The four training programs are compared in Table 10 along both cost and effectiveness dimensions.

Geske suggests that decision makers should prioritize program goals and should use a weighting scheme "to establish the relative importance of the different program objectives."[12] Thus weights (ranging from 1 to 4) were assigned to each of the measures of effectiveness presented in Tables 4 to 9. Weighted ranks for each of the four programs were computed from which average weighted ranks were obtained. Average weighted units of effectiveness ranged from 31.5 and 32.5 for programs A and C, respectively, to a high of 51.5 for program D.

Average program costs per participant presented in Table 2 range from $8188 for program B to a high of $9919 for program C. A measure of program cost per average unit of effectiveness, indicated for each program in Table 10, ranges from $159.63 for program D to $314.89 for program C.

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Insert Table 10 About Here

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[12]Geske, "Some Observations on Cost-Effectiveness Analysis in Education," p. 459.

TABLE 10

COMPARISON OF PROGRAM EFFECTIVENESS AND COST

Variable	Table	Weight	A				B				C				D			
			I		II		I		II		I		II		I		II	
			Rank	WR[a]	Rank	WR	Rank	WR	Rank	WR	Rank	WR	Rank	WR	Rank	WR	Rank	WR
Program Completion	4	4	1	4	2	8	3	12	2	8	4	16	2	8	2	8	4	16
Job Placement	5	4	1	4	2.5	10	3.5	14	2.5	10	2	8	1	4	3.5	14	4	16
Job Preference	6	2	3	6	-	-	2	4	-	-	1	2	-	-	4	8	-	-
Salary Preference	7	2	2.5	5	3.5	7	2.5	5	3.5	7	2.5	5	1.5	3	2.5	5	1.5	3
Responsibility/Authority	8	2	2	4	2.5	5	3.5	7	4	8	1	2	2.5	5	3.5	7	1	2
Program Quality	9	1	2	2	-	-	3	3	-	-	1	1	-	-	4	4	-	-
Expectations Realized	9	1	1	1	-	-	2	2	-	-	3	3	-	-	4	4	-	-
Total Weighted Rank[b]		High	39				50				40				60			
		Low	26				39				23				43			
		Average	32.5				44.5				31.5				51.5			
Program Cost per Student[c]			$8584.00				$8188.00				$9919.00				$8221.00			
Cost per Average Unit of Effectiveness			$264.12				$183.98				$314.89				$159.63			
Marginal Cost per Unit of Effectiveness			$104.49				$24.35				$155.26				----			

[a]Weighted rank.

[b]Sum of highest or lowest weighted rank for each variable using either criterion I or II, and average of high and low ranks.

[c]c.f. Table 2.

If a minimum level of effectiveness had been specified, say 40 for illustrative purposes, then programs B and D would be preferable. In addition, program B would be the least costly alternative for achieving that specified level of effectiveness. On the other hand, if a budgetary constraint dictated that not more than $8750 per student was available for program expenses, only A, B and D would be viable alternatives. The greatest effectiveness given that cost constraint would be realized under the format of alternative program D. Moreover, the lowest cost per average unit of effectiveness ($159.63) is realized under program D.

Despite a conclusion that program D appears to be the most cost-effective alternative, it should be pointed out that other analysts using different measures of effectiveness, varying assumptions in comparing those measures included herein, or applying other sets of weights for program objectives, might arrive at very different conclusions. Such considerations were kept in mind by the authors as programs were ranked using two assumptions to interpret several of the indicators of effectiveness and as high and low weighted ranks were averaged.

CONCLUSION

Given the data presented and our concluding caveats, none of the four administrator training programs reviewed can be identified categorically as the most (or least) cost-effective. Consequently, the findings of the analysis may be only marginally relevant to a decision maker. This being the case, the crucial question becomes:

What are the minimum conditions which must be realized if cost-effectiveness analysis is to be of utility to decision makers? We again turn to the four dimensions of cost-effectiveness — goals, alternatives, constraints and outcomes — to structure the discussion.

Objective Comparability of Goals

Administrative training programs for Native Americans are illustrative of the emergent social consciousness of the 1960's and 70's. Viewed in that sense, such endeavors were social action programs predicated upon a reallocation of values.[13] Predictably such reallocation was debated and ultimately legitimated at the highest levels of society -- the Federal government. Hence goal statements referred to earlier were essentially political expressions consenually arrived at, manifestly intended to appeal to wide and diverse constituencies, amenable to multiple interpretations, and difficult to evaluate uniformly. Even when "programmatically" reduced, the "political" content remained high and the outcome specificity low. Clearly, classical "goals-based" evaluation of a single program under such conditions is difficult; the comparative evaluation of multiple programs even more so.

Levin states that only programs with similar or identical goals can be compared under a cost-effectiveness framework.[14] Indeed, the analysis presented in the present study suggests that it may be difficult to compare educational programs which appear to be directed at a particular goal, yet in reality have a multiplicity of goals defined by the political contexts of diverse institutions, funding agents, and clients.

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[13]David Easton, A Framework for Political Analysis (Englewood Cliffs, N.J.: Prentice-Hall, 1965).

[14]Levin, "Case Book on Cost Analysis in Educational Evaluation," p. 16.

The Presence of "Real" Alternatives

Consideration was given to conceptually viewing programs A, B and C as one rather than three discrete alternatives for preparing Native American school administrators. Indeed, they are fundamentally identical on eight of the ten dimensions identified in Table 1. However, problems of data aggregation and variations among the three programs suggested otherwise. Further, all four programs were similar with respect to program model, i.e., all were "nested" and all were externally funded. Consequently, since decision theory at large and cost-effectiveness analysis in fine are dependent upon alternatives, we raise the question of what constitutes an alternative with some seriousness.

The present research effort suggests the following as potentially significant sources of variation in alternatives for higher education training programs. First, we propose variation in model. Burgess, et al., identify five: natural systems ("do it yourself"), scholarship, legislated morality, separate but equal, and nested.[15] These models currently exist; more could be generated. Clearly, logistical problems would be severe in studies based on differences in models, but they are not insuperable. Second, we suggest a full-time/part-time residency stipulation. Our study indicates that this is crucial relative to such issues as student dislocation, time required for completion, and cost (particularly in respect to student stipends and foregone earnings). Third, we suggest locus of control. Interorganizational decision making is manifestly more complex and costly than institutional decision making

[15] Burgess, et al., "Educational Leadership Development: The Contribution of One University."

which in turn is more complex and costly than individual decision making. Some data from the present study are available which speak to this issue but the impact on effectiveness is unclear.

Omitted from the above list are such variables as type of training institution (private vs. public university), source of funding, scope of recruitment, scope of program, and the like (cf. Table 1). Variation along these and other dimensions may be significant, but our immediate impression is that they contribute marginally to variation in effectiveness. They may, however, substantively vary with respect to costs.

All of the above raises a significant policy issue. Assuming that either costs or prescribed levels of effectiveness can be held constant, as the methodology of cost-effectiveness requires,[16] the potential for a "planned variation"[17] is clearly present. To engage in such planned variation, however, would require that a funding source (e.g., the Title IV desk of the Office of Indian Education) deliberately adopt as operational policy a cost-effectiveness evaluation stance, fund only those programs which conformed to the "planned variations" established, and involve evaluators in the initial planning stages rather than in a post hoc fashion in order to insure data comparability and adequacy. Clearly, such a policy stance would be difficult for any funding agency to adopt. Yet, it would seem reasonable to assume that neither would it be totally irrelevant.

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[16] Geske, "Some Observations on Cost-Effectiveness Analysis in Education."

[17] Alice Rivlin and Michael Timpane, eds. Planned Variation in Education: Should We Give Up or Try Harder? (Washington, D.C.: The Brookings Institution, 1975).

Resource Constraints

Of the four variables identified as being particularly germane to cost-effectiveness analysis, that of resource constraints is potentially the most troublesome. As identified earlier in this study, constraints were posed by a variety of sources including policies of the universities, colleges and departments involved, families and employers of students, funding agents, and, in the case of program D, a particular tribe. While it may be possible to assume a singular constraint or universalist set of constraints among programs in simulation studies, our experience is that it presumes an unrealistic view of the world.

In brief, we question the adequacy of cost-effectiveness formulations which posit that "meaningful comparisons can be made between the cost of different alternatives for achieving a prescribed effectiveness level, or between the effectiveness of different alternatives for a fixed budget level."[18] Such formulations suggest a simple two variable relationship -- budget level and prescribed level of effectiveness. This analysis of educational training programs suggests that contextual constraints must be taken into account as a third critical element. Hence a more appropriate approach to cost-effectiveness might be: "Given condition A (constraints) what might be an acceptable effectiveness level given a fixed budget?" or, "Given a prescribed effectiveness level, what might be an acceptable cost under condition B?" Such an approach seems more

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[18]Ceska, "Some Observations on Cost-Effectiveness Analysis in Education," p. 453.

[19]Elliot Mishler, "Meaning in Context: Is There Any Other Kind?" Harvard Educational Review 49 (1979), pp. 1-19.

productive than engaging in the "context-stripping"[19] activity which has dominated educational research and evaluation.

An additional problem with resource constraints involves the identification of all costs associated with alternatives. As in this study, analysts often rely upon program expenditures to represent dollar costs as well as social sacrifices incurred under alternative strategies. Dangers inherent in such an assumption are discussed by Levin:

> . . . a group of decision makers may rationally take into account only its own costs when making a choice among alternatives, but this does not mean that costs to other constituencies should be ignored in the overall evaluation. To the contrary, all costs should be reviewed for purposes of uncovering the true social sacrifice of resources associated with a given program and level of effectiveness.[20]

To this end, Levin suggests the use of a model for cost measurement in which the costs of various "ingredients" for each alternative are specified, and the agency or individual who bears the cost (or sacrifice) is indicated.

A strict accounting of all costs (including sacrifices) incurred by funding agencies, by sponsoring institutions, by external agencies and by students themselves is imperative in determining and comparing the true costs of alternative training programs. The problems with developing accurate cost information for each of the "ingredients," including both direct expenditures and costs shifted to other agencies or individuals, are obviously very complex. Nevertheless, if all costs had been identified for each program, and if costs had been determined using similar guidelines, perhaps greater differentiation among costs

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[20]Levin, "Cost-Effectiveness Analysis in Evaluation Research," p. 99.

of all alternative delivery systems would have been possible.

Measures of Effectiveness

Similar to the determination of resource constraints, difficulties are encountered in obtaining accurate measures of outcomes of educational programs. This is particularly true with studies such as the present one in which secondary data from independent appraisals of programs were employed in the analysis. The difficulties of determining program effectiveness given crude data, differing assumptions in gathering and analyzing data, and subjective weighting and interpretations of those effectiveness measures were realized in this analysis.

The importance, yet difficulty, of identifying educational goals as well as attainment of those goals has been discussed. This present experience with cost-effectiveness analysis leads to questioning its utility in the evaluation of social action programs with their multiple goals, uncertainty of meaning and measurement of "effectiveness", under-developed technology for the assessment of cost, and contextual dependencies. It appears that extant evaluation paradigms are unequal to the task of evaluating social action programs. Developing conceptually sound and operationally feasible social action program evaluation models should be a major agenda item for the 1980's.